

Bell Helicopter **TEXTRON**

A Subsidiary of Textron, Inc.

January 22, 2003

TO: All Owners/Operators of Bell 206L Series Helicopters

**SUBJECT: Revision "A" to Technical Bulletin 206L-02-207: (RIVETED
TAIL ROTOR DRIVESHAFT SEGMENT 206-040-385-101
AND RIVETED AFT SHORT SHAFT 206-040-383-101,
INTRODUCTION OF)**

Revision "A" to this bulletin is issued to clarify the inspection requirement of the Conditional Inspection for Main Rotor and Tail Rotor Sudden Stoppage.

TECHNICAL BULLETIN
Bell Helicopter **TEXTRON**

A Subsidiary of Textron Inc.

No. 206L-02-207

Date 01-09-02

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DATE 01-22-03
REV "A"

MODEL AFFECTED: 206L

SUBJECT: RIVETED TAIL ROTOR DRIVESHAFT SEGMENT
206-040-385-101 AND RIVETED AFT SHORT
SHAFT 206-040-383-101, INTRODUCTION OF

HELICOPTERS AFFECTED: 206L helicopters: S/N 45001 through 45153 and S/N
46601 through 46617.

206L-1 helicopters: S/N 45154 through 45790.

206L-3 helicopters: S/N 51001 through 51612.

204L-4 helicopters: S/N 52001 through 52223.

(Helicopters Serial Number 52224 and subsequent
will have the intent of this bulletin completed before
delivery.)

COMPLIANCE: At Customer's Option

DESCRIPTION:

This bulletin introduces a segmented tail rotor driveshaft 206-040-385-101 and aft short shaft 206-040-383-101 to replace the segmented driveshaft 206-040-365-001/-117/-125 and the aft short shaft 206-040-369-001/-101. Both those new shafts have their adapters riveted to the shaft tube. This new manufacturing process provides a positive lock between the shaft tube and the adapters.

A riveted shaft may be intermixed with a bonded shaft in any combination on any of the 206L, L-1, L-3, and L-4 helicopters. However, (rotor brake) disc 9440904 shall be installed with the 206L helicopter Serial Number 45001 through 45153 and 46601 through 46617. The disc shall be installed at initial replacement of a bonded shaft with a riveted shaft if a rotor brake kit is not previously installed.

APPROVAL:

The engineering design aspects of this Technical Bulletin are Transport Canada approved.

MANPOWER:

Approximately .5 man-hour is necessary to replace the aft short shaft assembly.

Approximately 2 man-hours are necessary to replace a segmented driveshaft assembly.

Approximately 4 man-hours are necessary to install a rotor brake disc.

The man-hours are based on hands-on time and can change due to the personnel and facilities available.

MATERIALS:

Required Material:

The material that follows is necessary to complete this Technical bulletin and can be procured through Bell Helicopter Supply Center.

Order **hardware kit CT-206L-02-207-1** that includes the parts that follow

PART I

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
206-040-383-101	Aft short shaft	1
206-040-385-101	Segmented driveshaft assembly	5
206-040-339-101	Bearing (*)	5

(*) Bearing, 206-040-339-103, is an approved alternate to bearing, 206-040-339-101.

PART II

Order **hardware kit CT-206L-02-207-2** that includes the parts that follow:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
206-706-114-001	Ring	1
9440904	Disc	1
AN4C7A	Bolt	4
MS21043-4	Nut	4
NAS1149C0463R	Washer	4
NAS1149F0432P	Washer	4

SPECIAL TOOLS:

No additional tools are required. Refer to the applicable Maintenance Manual and Component Repair and Overhaul Manual.

WEIGHT AND BALANCE:

<u>Weight</u>	<u>Arm</u>	<u>Longitudinal Moment</u>	<u>Arm</u>	<u>Lateral* Moment</u>
+2.25 Lbs	151.8 in.	+341.55 in-Lbs	Not affected	Not affected
+1.020 kg	3855 mm	+39.32 kg x mm/100		

* In lateral calculations, - is left and + is right.

ELECTRICAL LOAD DATA:

Not affected

REFERENCES:

BHT-206L-MM-1, Rev 20, 01 June 1987.

Chapter 66, Power Train.

BHT-206L1-MM-1, Rev 15, 1 June 1987.

Chapter 66, Tail Rotor Drive System.

BHT-206L3-MM-7, Rev 1, 21 July 1993.

Chapter 65, Tail Rotor Drive System.

BHT-206L4-MM-7, Rev 0, 2 December 1992.

Chapter 65, Tail Rotor Drive System.

BHT-206L-CR&O-4, Rev 0, 18 June 1993.

Chapter 65, Tail Rotor Drive System.

PUBLICATIONS AFFECTED:

BHT-206L-SERIES-IPB, Rev. 1, 2 February 1998.

Chapter 65, Tail Rotor Drive System.

BHT-206L-CR&O-4, Rev 0, 18 June 1993.

Chapter 65, Tail Rotor Drive System.

ACCOMPLISHMENT INSTRUCTIONS:

PART I: Installation of riveted driveshaft

1. Remove the existing bonded segmented driveshaft assemblies and aft short shaft (BHT-206L-MM, Chapter 66)(BHT-206L1-MM, Chapter 66)(BHT-206L3-MM, Chapter 65)(BHT-206L4-MM, Chapter 65).
2. Replace the bonded segmented driveshaft with segmented riveted driveshaft as follows:
 - a. Disassemble the segmented driveshaft assembly (BHT-206L-CR&O, Chapter 65).
 - b. Bonded shafts will not be used during reassembly.
 - c. Examine the remaining parts for condition.
 - d. Reassemble the riveted segmented shaft assembly (BHT-206L-CR&O).

3. Install segmented riveted driveshaft assemblies and aft riveted short shaft (BHT-206L-MM, Chapter 66)(BHT-206L1-MM, Chapter 66)(BHT-206L3-MM, Chapter 65)(BHT-206L4-MM, Chapter 65).
4. For the 206L serial number 45001 through 45153 and 46601 through 46617, install disc 9440904 as per PART II of this bulletin.
5. Make an entry in the tail rotor driveshaft assembly Historical Record to show that this Technical Bulletin is completed.

PART II: Installation of disc 9440904

1. Remove the engine to transmission driveshaft (BHT-206L-MM, Chapter 66).
2. Disassemble the engine to transmission driveshaft (BHT-206L-CR&O, Chapter 63).
3. Install disc 9440904 (Figure 1).
4. Assemble the engine to transmission driveshaft (BHT-206L-CR&O, Chapter 63).
5. Install the engine to transmission driveshaft (BHT-206L-MM, Chapter 66).
6. Adjust your Weight and Balance.

PART III: Inspection for the aft short shaft 206-040-383-101 and segmented driveshaft assemblies 206-040-385-101

1. At each 100 flight hours, do the inspection that follows:
 - a. Examine the aft short shaft for condition and security (refer to figure 2).
 - Loose and working rivets.
 - b. Examine the tube of the segmented driveshaft assembly for condition and security (refer to figure 3).
 - Loose and working rivets.
 - c. Do a torque check of the disc pack attachment hardware.
2. Conditional inspection after a Main Rotor Sudden Stoppage:
 - a. Examine the tail rotor driveshaft assemblies for condition.
 - b. If the tail rotor driveshafts show no signs of torsional yielding, the tail rotor driveshaft segments are serviceable.

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- c. If the tail rotor driveshafts show signs of torsional yielding, do a Sudden stoppage – Tail rotor inspection (refer to next step).
3. Conditional inspection after a Tail Rotor Sudden Stoppage:
 - a. Examine the tail rotor driveshaft assemblies for condition.
 - b. If a tail rotor driveshaft was damaged by a main rotor strike or has damage other than torsional overload, discard the damaged segment assembly and the segment assemblies fwd-and-aft of the damaged driveshaft. Remove the remaining hanger and bearing assemblies. Put tags on the hanger and bearing assemblies and write, "THIS HANGER AND BEARING ASSEMBLY WAS REMOVED FROM SERVICE BECAUSE OF A SUDDEN STOPPAGE". Send the hanger and bearing assemblies to an approved facility for overhaul.
 - c. If a tail rotor driveshaft fails because of a torsional overload, discard all of the hangers, driveshafts, adapters, impeller, and disc couplings. Remove the tail rotor gearbox. Put a tag to the tail rotor gearbox and write, "THIS TAIL ROTOR GEARBOX WAS REMOVED FROM SERVICE BECAUSE OF A SUDDEN STOPPAGE". Send the tail rotor gearbox to an approved facility for overhaul.
 - d. If the visual inspection and total indicated runout (TIR) show no signs of damage, the tail rotor driveshaft assemblies are serviceable.

PART IV: Stripping and Painting of the aft short shaft 206-040-383-101 and segmented driveshaft assemblies 206-040-385-101

CAUTION

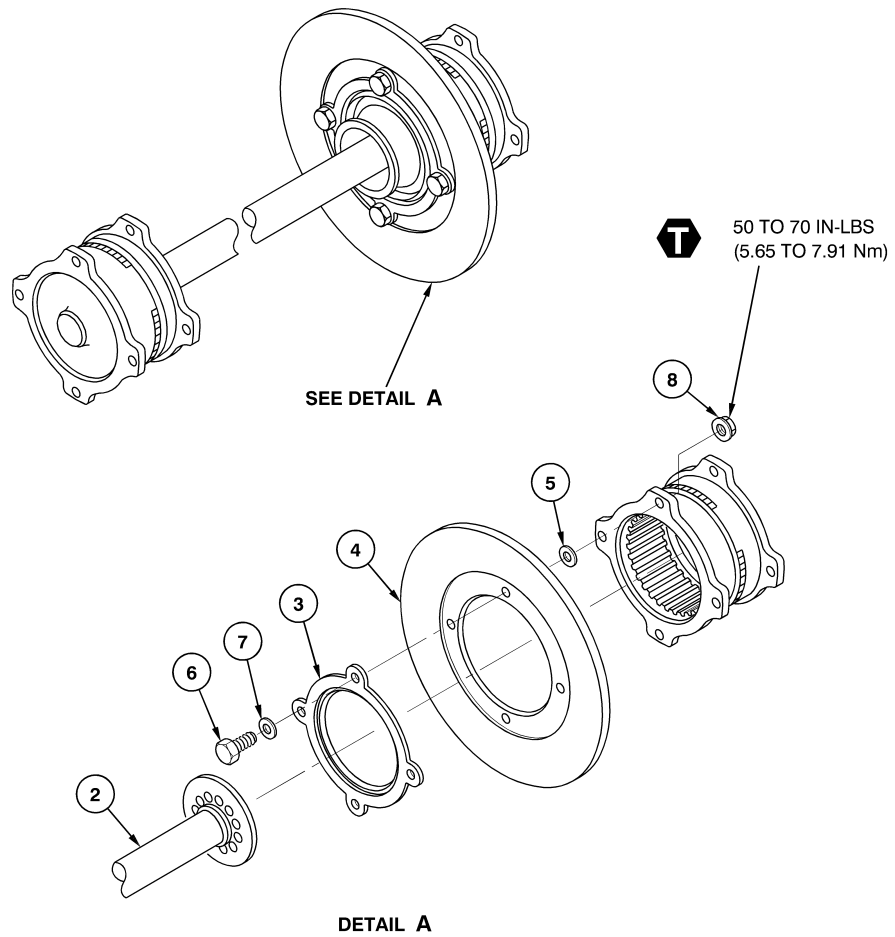
DO NOT USE CHEMICAL PRODUCTS TO REMOVE THE ORGANIC FINISH FROM THE SHAFT. YOU CAN NOT RINSE THE CHEMICAL PAINT REMOVER FULLY FROM THE GAP BETWEEN THE RIVETED ADAPTER AND THE SHAFT. THE MECHANICAL RIVETS CAN START TO CORRODE IN A WAY THAT CAN NOT BE DETECTED.

-NOTE-

Do not Plastic Media Blast (PMB) the end face of the adapters riveted to the shaft. You can remove the adhesive used to bond the stoppers in the end face of the adapters by PMB.

1. Use PMB (BHT-ALL-SPM) to remove the organic finish from shaft outside diameter, if it is required to do the Non Destructive Inspection as a result of a conditional inspection or some other reason.

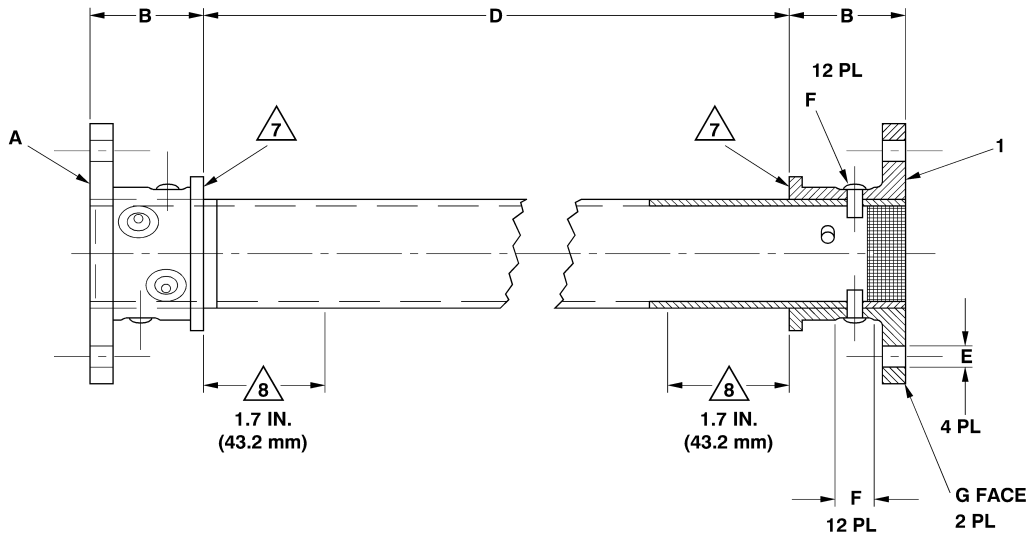
2. After repair on the shaft outside diameter apply a chemical protection layer to the exposed bare metal (BHT-ALL-SPM).
3. Apply organic finish to the shaft outside diameter (Figure 4). Refer to the Standard Practice Manual (BHT-ALL-SPM) for application procedures of the Polyamide Epoxy primer and the Polyurethane Enamel except as otherwise specified in Figure 4.
4. Do touch-up of the Epoxy primer and the Polyurethane Enamel as necessary (BHT-ALL-SPM).



1. Coupling
2. Driveshaft
3. Ring (206-706-114-001)
4. Disk (9440904)
5. Washer (NAS1149F0432P)
6. Bolt (AN4C7A)
7. Washer (NAS1149C0463R)
8. Nut (MS21043-4)

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Figure 1. Modification of main driveshaft



(206-040-383-101)

NO	REF AREA	DESCRIPTION	CHARACTERISTIC	INSPECTION PROCEDURE	LIMITS
1	A	Adapter end face	Corrosion	Measure	Only superficial corrosion, removable with abrasive pad.
2	A	Adapter end face	Mechanical	Measure	0.002 inch (0.051 mm) up to 25% of area.
3	B	Adapter external diameter	Corrosion/Mechanical	Measure	0.005 inch (0.127 mm) up to 50% of the circumference.
4	B	Adapter flange	Corrosion/Mechanical	Measure	Maximum chamfer to remove the damage is 0.030 inch (0.762 mm) X 40-45 degrees up to 0.50 inch (12.700 mm) (no more than 2 per quadrant).
5	C	Rivet spotface	Corrosion/Mechanical	Visual	None adjacent to rivet head. 0.005 inch (0.127 mm) of the remaining spotface.

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Figure 2. Aft short shaft-inspection (sheet 1 of 2)

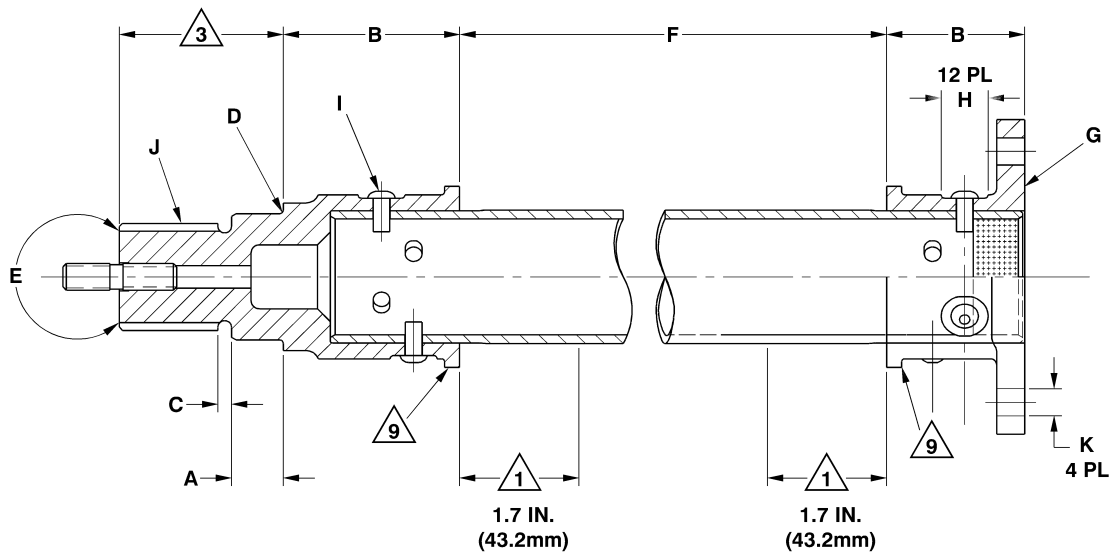
6	D	Tube outside diameter	Corrosion/Mechanical	Measure	0.005 inch (0.127 mm) to 25% of the circumference. 0.002 inch (0.051 mm) up to 100% of the circumference. (NOTE 5)
7	E	Fastener hole	Wear	Measure	Maximum of 0.2530 inch (6.426 mm) diameter.
8	F	Rivets	Loose rivets		None allowed. (NOTE 6)
9	G	Adapter faces	TIR	Measure	TIR done with the shaft mounted on V-blocks. Maximum of 0.004 inch (0.102 mm). (NOTE 8)

NOTES

1. Remove two times the depth of the corrosion to repair a corroded surface. The limits shown are after the repair is completed.
2. Refer to the Corrosion Control Manual (BHT-CSSD-PSE-1) to do the repairs.
3. Refer to the Standard Practice Manual (BHT-ALL-SPM) for the procedures to Chemically Film Treat the repaired area.
4. Blend in repairs with a 0.25 inch (6.35 mm) minimum radius and a 32 RMS surface finish.
5. Surface of the tube must be smooth and unmarred. Scratches can be polished out so that the minimum outside diameter is not less than 1.235 inches (31.370 mm).
6. Replacement of the rivets is not permitted.
7. When damaged material must be removed from the balancing rim, remove an equal amount of material on the same rim, at 180 degrees opposite to the repair area.
8. Prior to mounting the shaft on V-blocks at the two indicated areas paint must be removed from those areas.

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Figure 2. Aft short shaft-Inspection (sheet 2)



(206-040-385-101)

NO	REF AREA	DESCRIPTION	CHARACTERISTIC	INSPECTION PROCEDURE	LIMITS
1	A	Bearing journal	Corrosion		Only superficial corrosion, removable with abrasive pad.
2	A	Bearing journal	Mechanical	Measure	0.005 inch (0.127 mm) up to 0.250 inch (6.35 mm) long must be polished to remove all raised material.
3	A	Bearing journal	Wear	Measure	1.1803 inches (29.979 mm) minimum. Signs of bearing spinning are not acceptable.
4	B	Adapter external diameter	Corrosion/Mechanical	Measure	0.005 inch (0.127 mm) up to 50% of the circumference.
5	B	Adapter flange	Corrosion/Mechanical	Measure	Maximum chamfer to remove the damage is 0.030 inch (0.762 mm) X 40-45 degrees up to 0.50 inch (12.700 mm) (no more than 2 per quadrant).
6	C	Spline relief	Corrosion		Only superficial corrosion, removable with abrasive pad.

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Figure 3. Segmented driveshaft-inspection (sheet 1 of 3)

7	C	Spline relief	Mechanical	Measure	0.002 inch (0.051 mm) may be blended smooth.
8	D	Shoulder	Corrosion/Mechanical	Measure	0.001 inch (0.025 mm) up to 25% of the circumference.
9	E	Spline adapter end face	Corrosion/Mechanical	Measure	0.010 inch (0.254 mm), remove all raised material.
10	F	Tube outside diameter	Corrosion/Mechanical	Measure	0.005 inch (0.127 mm) to 25% of the circumference. 0.002 inch (0.051 mm) up to 100% of the circumference. (Note 2)
11	G	Flange adapter end face	Corrosion		Only superficial corrosion, removable with abrasive pad.
12	G	Flange adapter end face	Mechanical	Measure	0.002 inch (0.051 mm) up to 25% of area.
13	G	Adapter faces	TIR	Measure	TIR done with the shaft mounted on V-blocks. Maximum of 0.004 inch (0.102 mm). (Note 1)
14	H	Rivet spotface	Corrosion/Mechanical	Visual	None adjacent to rivet head. 0.005 inch (0.127 mm) of the remaining spotface.
15	I	Rivets	Loose rivets		None allowed. (Note 7)
16	J	Spline-measure over 0.1200 inch (3.048 mm) diameter pin.	Wear	Measure	1.107 inches (28.117 mm). (Note 5)
17	J	Spline-sides, roots and ends of teeth.	Corrosion/Mechanical	Visual	Light, superficial that can be polished out by hand with the use of a fine stainless steel wool or abrasive pad. (Note 6)
18	K	Fastener hole	Wear	Measure	Maximum of 0.2530 inch (6.426 mm) diameter.

NOTES

1. Prior to mounting the shaft on V-blocks at the two indicated areas paint must be removed from those areas. Measure the TIR at the bearing seat shoulder and the adapter flange. The shaft must be discarded if the measurement exceeds one of the dimensions that follow :

A	Bearing seat	0.001 inch (0.025 mm) TIR
D	Bearing seal shoulder	0.004 inch (0.102 mm) TIR
G	Adapter flange	0.004 inch (0.102 mm) TIR

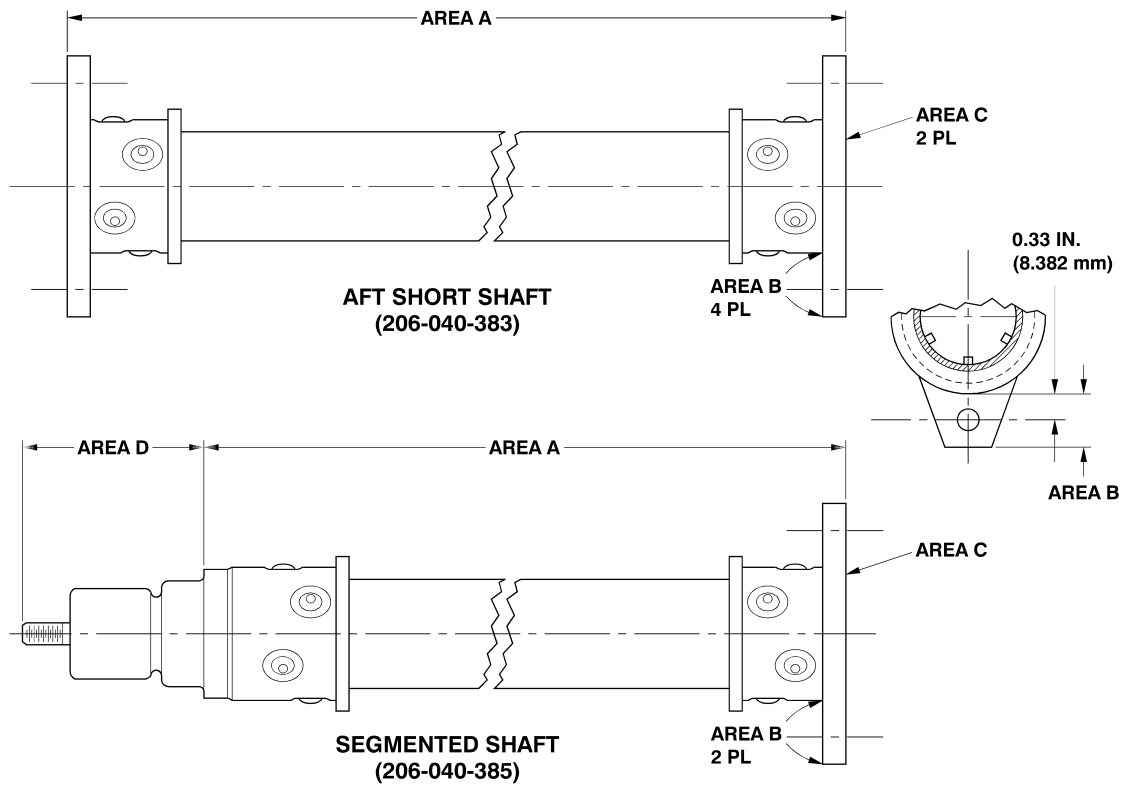
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Figure 3. Segmented driveshaft-inspection (sheet 2)

2. Surface of the tube must be smooth and unmarred. Scratches can be polished out so the minimum outside diameter is not less than 1.235 inches (31.370 mm).
3. Replace a stud that is distorted, loose, or with threads that are damaged. If the stud is loose, replace it with an oversize stud. Examine the threaded stud hole and the stud for corrosion. No corrosion is permitted past first thread. Discard the shaft if corrosion is present in the threaded stud hole. Discard the stud if it is corroded. Install the replacement stud with unreduced primer (C-201, BHT-ALL-SPM) or primer (C-204, BHT-ALL-SPM). The height of the stud as measured on the figure is 2.049 to 2.069 inches (52.045 to 52.553 mm) when it is torqued at 50 to 95 in-lbs (5.65 to 10.74 nm)
4. Refer to Standard Practice Manual (BHT-ALL-SPM) for the procedures to Chemically Film Treat the repaired area.
5. Examine the spline teeth for signs of a wear step. Discard the shaft if you can feel a wear step with a 0.030 inch (0.762 mm) spherical radius probe.
6. Refer to the Corrosion Control Manual (BHT-CSSD-PSE-1) to do the repairs.
7. Replacement of the rivets is not permitted.
8. Make repairs with a 0.25 inch (6.35 mm) minimum radius and a 32 RMS surface finish.
9. When damaged material must be removed from the balancing rim, remove an equal amount of material on the same rim, at 180 degrees opposite to the repair area.
10. Remove two times the depth of the corrosion to repair a corroded surface. The limits shown are after the repair is completed.

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Figure 3. Segmented driveshaft-inspection (sheet 3)



NOTES

Epoxy Primer - Application

Apply one layer of epoxy primer (C-202, BHT-ALL-SPM) or primer (C-204, BHT-ALL-SPM) to the area A of the driveshaft. Do not apply primer to the areas B, C, and D.

It is not necessary to let the mixed primer stand at room temperature for one hour before application.

Keep the driveshaft in a vertical position while it dries to prevent puddling of the primer and a loss of dynamic balance.

Polyurethane Enamel - Application

Apply two layers of the polyurethane enamel MIL-C-83286, FED-STD-595, color # 16440 (light grey) to the area A of the driveshaft. Do not apply the polyurethane enamel to the areas B, C, and D.

The humidity must be between 50 and 90%.

Apply the first polyurethane enamel layer between one and eight hours after the primer is applied.

After each layer of the polyurethane enamel, put the driveshaft in a vertical position while it dries to prevent puddling of the polyurethane enamel and a loss of dynamic balance.

The dried film thickness of the polyurethane enamel layer is 0.0085 to 0.00115 inch (0.216 to 0.029 mm).

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Figure 4. Epoxy primer and polyurethane enamel - Application